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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,669	11/20/2001	Tetsuya Kojima	Q66491	9037

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EXAMINER

FEGGINS, KRISTAL J

ART UNIT

PAPER NUMBER

2861

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/988,669

Applicant(s)

KOJIMA ET AL.

Examiner

K. Feggins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 19-22 is/are rejected.
- 7) ☒ Claim(s) 12-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1- 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Inui et al. (U.S. 5,363,125).

Inui et al. disclose the following claimed limitations:

* regarding claim 1; an image recording/thermal printer/ method (Title) of recording a single pixel forming an image using a plurality of pulses (Abstract)

* the step of expressing gradation/desirable tonal/ using a first pulse expressing a superordination/single pulse/ bit having a larger pulse width and a second pulse expressing a subordination/plurality of pulses/ bit having a smaller pulse width (Abstract, col. 3, lines 13-24, col. 6, lines 11-14, 20-25, fig 2).

* regarding claims 2 & 6; the step of and an image recording apparatus: said first pulse expressing said superordination/single pulse/ bit having said larger pulse width lying at irregular intervals/thermal elements driven by intermittent current pulses/ applied to said single pixel (col. 3, lines 24-27, col. 7, lines 10-15, 23-26, figs 2 & 6).

(A number of pulses are used to form 1 pixel. The pulses consist of a long pulse and several short pulses; the pulses relates to the 8-bit image data. The width of these

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pulses is controlled according to the position of the corresponding pixel and the corresponding sub-line position in the pixel. In other words the heat energy accumulated in the recording head thermal elements is taken into consideration when determining the width of the drive pulses.)

* regarding claim 3; the step of: having activation or non-activation operation/strobe signal generator controls the on-off signals of the pulses, each pulse pertains to a certain bit image data/ for each of said pulses, related to a specified bit forming image data (col. 3, lines 13-22, col. 6, lines 11-30, figs 1-2).

* regarding claim 4; the steps of: expressing gradation/desirable tonal/ using a first pulse having a larger pulse width expressing a superordination/single pulse/ bit and a second pulse having a smaller pulse width expressing a subordination/plurality of pulses/ bit (Abstract, col. 3, lines 13-24, col. 6, lines 11-14, 20-25, fig 2)

* having activation or non-activation operation/ strobe signal generator controls the on-off signals of the pulses, each pulse pertains to a certain bit of image data/ for each of said pulses, related to a specified bit forming image data (col. 3, lines 13-22, col. 6, lines 11-30, figs 1-2).

* regarding claim 5; an image recording apparatus/thermal printer/

* an image recording unit/thermal printer/ which records an image in a first direction/main scan direction/;

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* a transfer unit which relatively transfers said image recording unit and a recording medium in a second direction/sub scan direction/ normal to said first direction (col. 3, lines 13-15, 32-35, figs 1-2);

* a record control unit/system controller (21 of fig 1)/ which controls and records a single pixel using a plurality of pulses/8-bit image data/ when said image is recorded, said record control unit/system controller (21)/ expressing gradation for said image to be recorded using a first pulse having a larger pulse width expressing a superordination/single pulse/ bit and a second pulse having a smaller pulse width expressing a subordination/plurality of pulses/ bit (Abstract, col. 2, lines 60-68, col. 3, lines 5-24, col. 6, lines 11-14, 20-25, figs 1- 2).

(The system controller controls the memory controller and the half-tone controller. The memory controller controls the frame memory which writes the image data by frames and is sent to the half tone controller to perform gradation correction of the image data and the corrected image data is sent to the recording head)

* regarding claim 7; said record control unit having activation or non-activation operation/strobe signal generator controls the on-off signals of the pulses, each pulse pertains to a certain bit of image data/ for each of said pulses, related to a specified bit forming image data (col. 3, lines 13-22, col. 6, lines 11-30, figs 1-2).

* regarding claim 8; said record control unit expressing gradation for said image to be recorded using a first pulse having a larger pulse width expressing a

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superordination/single pulse/ bit and a second pulse having a smaller pulse width expressing a subordination/plurality of pulses/ bit, and having activation or non-activation operation/strobe signal generator controls the on-off signals of the pulses, each pulse pertains to a certain bit image data/ for each of said pulses, related to a specified bit forming image data. (col. 3, lines 13-22, col. 6, lines 11-30, figs 1-2).

* regarding claims 9-11, said image recording unit/thermal printer/ (Title and Abstract) being provided a thermal head/recording head with thermal elements/ (col. 3, lines 13-15, fig 2, item 19 & 19A- M).

* regarding claim 20, said control unit/13/ comprising a data storage unit that stores data indicative of the correlation between said superordination/single pulse/ bit and said first pulse and said subordination/plurality of pulses/ bit and the second pulse /The memory controller controls the frame memory which writes the image data by frames and is sent to the half tone controller to perform gradation correction of the image data and the corrected image data is sent to the recording head/(col 2, line 55-col 3, line 4).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 21 & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inui et al. (U.S. 5,363,125) in view of Kurachi (US 6222572 B2).

Inui et al. disclose all of the claimed limitations except for the following:

- * regarding claim 19, where thermal patterns are made to be different between at least one neighboring pixels and neighboring lines of image data

- * regarding claims 21 & 22, wherein a gradation of N levels is expressed using few than N-1 pulse.

Kurachi disclose the following claimed limitation:

- * regarding claim 19, where thermal patterns are made to be different between at least one neighboring pixels and neighboring lines of image data (col 10, lines 1-21) for the purpose of achieving a smooth change in gradation without degrading resolution.

- * regarding claims 21 & 22, wherein a gradation of N levels is expressed using few than N-1 pulse (col 8, lines 1-7) for purpose of providing an apparatus resulting in the great increment of the number of gradation levels with a constant resolution and a smooth change in the gradation of each pixel.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize thermal patterns that are made to be different between at least one neighboring pixels and neighboring lines of image data and a gradation of N levels is expressed using few than N-1 pulse, taught by Kurachi into Inui et al. for the purpose of achieving a smooth change in gradation without degrading

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resolution and providing an apparatus resulting in the great increment of the number of gradation levels with a constant resolution and a smooth change in the gradation of each pixel.

Allowable Subject Matter

5. Claims 12-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The primary reason for indicating allowable subject matter of claims 12-14 is the inclusion of the limitations of an image recording apparatus that includes a controller that generates a plurality of timing signal that are transmitted to respective frequency divider to generate the plurality of pulses, wherein at least on to the frequency dividers outputs a second frequency divided signal to a processing circuit that generates at least one output in accordance with stored data. It is these limitations found in the claims, at they are claimed in the combination of, which has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for indicating allowable subject matter of claims 15-17 is the inclusion of the method steps of recording a single pixel forming an image that includes generating a plurality of timing signals that are transmitted to respective frequency dividers to generate said plurality of pulses; at least one of the frequency dividers outputting a first frequency divided signal to a switching device, and at least another of the frequency divider outputs a second frequency divided signal to a processing circuit

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and the processing circuit generating at least one output in accordance with stored data. It is these step found in the claims, at they are claimed in the combination of, which has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for indicating allowable subject matter of claim 18 is the inclusion of the limitations of an image recording apparatus that includes a pattern of generating the plurality of pulses is set to be random between the pixel positions in a horizontal direction to prevent cyclic irregularity. It is this limitation found in the claims, at they are claimed in the combination of, which has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

Response to Arguments

6. With regards to Applicant's argument that Inui fails to disclose expressing gradation using a first pulse expressing a superordination bit having a larger pulse width and a second pulse expressing a subordination bit having smaller pulse width is acknowledged. However, Inui does disclose using gradational half tones where the first pulse expressing a single pixel/bit/ that has a larger pulse width and a second pulse expressing a plurality of pulses that have smaller pulse width (Abstract, col. 3, lines 13-24, col. 6, lines 11-14, 20-25, fig 2).

With regards to Applicant's argument that Inui fails to disclose having an activation or a non-activation operation for each of the pulses, related to a specified bit forming image data is acknowledged. However, Inui does disclose an activation or a

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non-activation operation for each of the pulses, related to a specified bit. Inui discloses a strobe signal generator that controls the on-off signals of the pulses, each pulse pertains to a certain bit of image data or for each of said pulses, related to a specified bit forming image data (col. 3, lines 13-22, col. 6, lines 11-30, figs 1-2).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kokubo (U.S. 5,587,732) discloses a thermosensitive color recording paper with a thermal head that are driven by a pulse train constituted of a bias pulse and gradation pulses.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

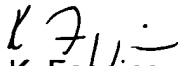
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Communication With The USPTO

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 703-306-4548. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Fuller can be reached on 703-308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-872-9318 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


K. Feggins
August 8, 2003


LAMSON NGUYEN
PRIMARY EXAMINER
08/10/03